

Claims

- [c1] A method of evaluating changes for a wellbore interval, comprising:
obtaining first log data acquired by a logging sensor (8, 5, 6, 3) during a
first pass over the wellbore interval;
obtaining second log data at a time later than the first log data, said
second log data being acquired by the logging sensor during a
second pass over the wellbore interval;
calculating a plurality of delta values between the first log data and the
second log data;
deriving an observed effect using the plurality of the delta values; and
identifying a correlation between the observed effect and a causal event.
- [c2] The method of claim 1, further comprising displaying the correlation on
a display device (82).
- [c3] The method of any of claims 1-2, wherein the logging sensor measures
at least one parameter selected from the group consisting of gamma ray,
resistivity, neutron porosity, density, ultrasonic caliper, and sigma.
- [c4] The method of any of claims 1-3, wherein the logging sensor is disposed
on an integrated measurement tool.
- [c5] The method of any of claims 1-4, wherein the correlation is a depth
correlation.
- [c6] The method of any of claims 1-5, wherein the correlation is a time
correlation.

- [c7] The method of claim 1, further comprising:
calculating a relative effect using a sensitivity factor to adjust the correlation; and
displaying the correlation and the relative effect on a display device (82).
- [c8] A system for evaluating changes for a wellbore interval comprising:
a well log data acquisition system (7) for acquiring first log data and second log data, at a time later than said first log data, from a logging sensor (8, 5, 6, 3) during a plurality of passes over the wellbore interval; and
a well log data processing system (72,74, 76) for:
calculating a plurality of delta values between the first log data and the second log data;
deriving an observed effect using the plurality of the delta values;
and
identifying a correlation between the observed effect and a causal event.
- [c9] The system of claim 8, further comprising a display device (82) for displaying the correlation.
- [c10] The system of any of claims 8-9, wherein the logging sensor measures at least one parameter selected from the group consisting of gamma ray, resistivity, neutron porosity, density, ultrasonic caliper, and sigma.
- [c11] The system of any of claims 8-10, wherein the logging sensor is disposed on an integrated measurement tool.
- [c12] The system of any of claims 8-11, wherein the correlation is a depth correlation.

[c13] The system of any of claims 8-12, wherein the correlation is a time correlation.

[c14] The system of claim 8, further comprising a well log data processing system (72, 74, 76) for calculating a relative effect using a sensitivity factor to adjust the correlation; and displaying the correlation and the relative effect on a display device.

[c15] A computer system for evaluating changes for a wellbore interval, comprising:

a processor (72);

a memory (74);

a storage device (76);

a computer display (82); and

software instructions stored in the memory for enabling the computer system under control of the processor, to perform:

gathering first log data from a logging sensor during a first pass over the wellbore interval;

gathering second log data, at a time later than said first log data, from the logging sensor during a second pass over the wellbore interval;

calculating a plurality of delta values between the first log data and the second log data;

deriving an observed effect using the plurality of the delta values;

identifying a correlation between the observed effect and a causal event; and

displaying the correlation on the computer display.